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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
09/816,937	03/23/2001	James F. Brennan III	55524USA9A.002	6957

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Office of Intellectual Property Counsel
3M Innovative Properties Company
PO Box 33427
St. Paul, MN 55133-3427

EXAMINER

SUCHECKI, KRISTYNA

ART UNIT PAPER NUMBER

2882

DATE MAILED: 12/26/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/816,937

Applicant(s)

BRENNAN ET AL.

Examiner

Krystyna Suchecki

Art Unit

2882

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☐ Responsive to communication(s) filed on ____.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) 10-28 is/are withdrawn from consideration.
- 5) ☐ Claim(s) ____ is/are allowed.
- 6) ☒ Claim(s) 1-9, 29 and 30 is/are rejected.
- 7) ☒ Claim(s) 8 is/are objected to.
- 8) ☒ Claim(s) 1-30 are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 23 March 2001 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on ____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. ____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) ____.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) ____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Election/Restrictions

1. Restriction to one of the following inventions is required under 35 U.S.C. 121:
 - I. Claims 1-9 and 29-30, drawn to a method for producing a pulse train using compression of the signal in time, classified in class 385, subclass 15.
 - II. Claims 10-13, drawn to a method for frequency modulation of an optical carrier in a laser cavity, classified in class 372, subclass 32.
 - III. Claims 14-25, drawn to an apparatus for producing a frequency modulated signal comprising a dispersive element within a laser cavity and associated methods for using the apparatus, classified in class 372, subclass 102.
 - IV. Claims 26-28, drawn to an apparatus for producing a frequency modulated signal comprising a signal source adapted to generate a frequency modified signal and a dispersive element, classified in class 359, subclass 278.
2. Inventions I and II are related as subcombinations disclosed as usable together in a single combination. The subcombinations are distinct from each other if they are shown to be separately usable. In the instant case, invention I has separate utility such as without the particulars of invention II. See MPEP § 806.05(d).
3. Inventions III-IV and I-II are related as product and process of use. The inventions can be shown to be distinct if either or both of the following can be shown: (1) the process for using the product as claimed can be practiced with another materially different product or (2) the product as claimed can be used in a materially different process of using that product (MPEP § 806.05(h)). In the instant case the inventions of groups I and II are two distinct methods for

Art Unit: 2882

utilizing one of the two distinct apparatuses of groups III and IV. The duo of apparatuses and duo of methods for using the apparatuses cause there to be multiple inventions wherein the apparatus of Group III could possibly be used with either method or another method without the particulars of Group I or II, and likewise the apparatus of Group IV could be used with either method or another method without the particulars of Group I or II.

4. Inventions III and IV are related as subcombinations disclosed as usable together in a single combination. The subcombinations are distinct from each other if they are shown to be separately usable. In the instant case, invention III has separate utility such as a rapidly tunable laser and a dispersive element disposed inside of a laser cavity without current induced changes in refraction of a reflective element. See MPEP § 806.05(d).

5. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art because of their recognized divergent subject matter, restriction for examination purposes as indicated is proper.

6. Because these inventions are distinct for the reasons given above and have acquired a separate status in the art as shown by their different classification, restriction for examination purposes as indicated is proper.

7. Applicant is reminded that upon the cancellation of claims to a non-elected invention, the inventorship must be amended in compliance with 37 CFR 1.48(b) if one or more of the currently named inventors is no longer an inventor of at least one claim remaining in the application. Any amendment of inventorship must be accompanied by a request under 37 CFR 1.48(b) and by the fee required under 37 CFR 1.17(i).

Art Unit: 2882

8. During a telephone conversation with Nestor Ho on 12/18/02 a provisional election was made without traverse to prosecute the invention of Group I, claims 1-9 and 29-30. Affirmation of this election must be made by applicant in replying to this Office action. Claims 10-28 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention.

Drawings

9. The drawings are objected to because it is unclear what Character 50 is inclusive of. It appears that 50 is representative of either just the bias tee, or the elements disposed along the horizontal axis of the drawing. It is disclosed that item 50 is a signal source. An enclosure of some sort, such as a dashed box, should surround the elements included in item 50. A similar objection is made for item 100. An enclosure surrounding the pulse train generator should be made. Also, item 10 is objected to for being disclosed as a two-part element, but is shown as a single piece connected to a multiplicity of parts. The incorporation by reference of the signal source's parts and operation is not adequate for a proper understanding of the invention, especially in light of the above objections with respect to the boundaries of elements. Items 10 and 50 are further objected to as having both been disclosed as a signal source. Both characters cannot be the signal source, especially in light of the above objections. If one item is a smaller part of another element, a separate title for the item must be given, and the parts included in the other must be clearly shown. Item 12 is objected to as being shown applied to the bias tee, despite its description in the specification as being applied to the mirror section of the DBR. OSA is shown as item 80, but disclosed as item 9 (in line 26, page 5). A proposed drawing

Art Unit: 2882

correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

10. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they include the following reference sign(s) not mentioned in the description: I_DC. A proposed drawing correction, corrected drawings, or amendment to the specification to add the reference sign(s) in the description, are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

11. The drawings are objected to as failing to comply with 37 CFR 1.84(p)(5) because they do not include the following reference sign(s) mentioned in the description: GVD; a mirror in a DBR; the application of item 12 to a mirror of a DBR; a graded index lens; isolator 7; coupler/splitter and its relationship to item 20; and a spatially chirped Bragg grating connected to a circulator to cause compression of the signal. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

12. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, a dispersive element used to cause compression of the signal in time, the relationship of the dispersive element to a clear and correct representation of a frequency modified laser; and a laser equipped with a reflective element and its interaction with a current source must be shown or the feature(s) canceled from the claim(s).

No new matter should be entered.

Art Unit: 2882

13. A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

Claim Objections

14. Claim 8 is objected to because of the following informalities: "the mirror" is referred to in the last line of the claim, yet only a reflective element has been previously introduced. There is insufficient antecedent for the limitation in the claim. For examination purposes, Examiner assumes "the reflective element" was intended. Appropriate correction is required.

Claim Rejections - 35 USC § 112

15. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

16. Claims 4-6 recite the limitations: "wherein the fiber has a length of at least about 40km" in line 1; "wherein the fiber has a length of at least about 60km" in line 1; and "wherein the fiber has a length of at least about 80km" in line 1. There is insufficient antecedent basis for these limitations in the claims.

Claim Rejections - 35 USC § 103

17. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

18. Claims 1-9 and 29-30 are rejected under 35 U.S.C. 103(a) as being unpatentable over Heritage et al. (US 4,928,316) in view of Kjebon.

19. Regarding Claim 1, Heritage teaches a method for generating a pulse train, comprising the steps of providing a signal (Column 5, lines 40-45); and impinging the signal on a dispersive element (Column 5, lines 45-63), said dispersive element being adapted to compress the signal in time (Column 5, lines 59-63).

20. Heritage does not specifically teach the use of a frequency modulated signal. He instead teaches that any suitable source of a signal is useable in the dispersive system taught (Column 5, lines 40-45).

21. Kjebon teaches a laser source with an integral dispersive element (Fig. 1). The device of Kjebon is used for the purpose of creating a signal of 30 GHz on a laser, which according to the article by Kjebon is a record high signal with increased resonance frequency and reduced damping.

22. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a known laser device to create frequency modulated signals of high bandwidth for the laser of Heritage for the benefits of using a record high bandwidth signal with increased resonance frequency and reduced damping.

23. Regarding Claims 2-3, Heritage teaches the method of claim 1 wherein the dispersive element is a fiber Bragg grating and further teaches the element is a single mode fiber (Column 7, lines 44-65).

Art Unit: 2882

24. Regarding Claims 4-6, Heritage teaches that the fiber length of the dispersive system increases under certain circumstances (Column 3, lines 28-62, especially Column 7, lines 10-13 and Column 4, lines 43-45 of Patent 4,746,193 cited by Heritage). The increase in length of the dispersive element is understood to include lengths of at least 40, 60 or 80 km.
25. Regarding Claim 7, Kjebon teaches a signal having a single longitudinal mode (Page 488-489).
26. Regarding Claim 8, Kjebon teaches a signal generated by a laser equipped with a reflective element, and wherein the signal is frequency modulated by applying a current across the reflective element (Page 488-489).
27. Regarding Claim 9, Kjebon teaches a range of wavelengths, understood to include the center wavelength of the reflective element, for the laser, wherein the current modulates the center wavelength by way of carrier induced index changes (Pages 488-489).
28. Regarding Claim 29, Heritage teaches a method for producing a pulse train, comprising the steps of: providing an optical signal (Column 5, lines 40-45); providing a dispersive element; and directing the signal into the dispersive element (Column 5, lines 45-63), wherein the dispersive element is a long fiber Bragg grating (Columns 3, 5 and 7 teach the use of many art recognized grating schemas through reference, understood to include long fiber Bragg gratings).
29. Heritage does not specifically teach the use of a frequency modulated laser for providing a frequency modified optical signal. He instead teaches that any suitable source of a signal is useable in the dispersive system taught (Column 5, lines 40-45).

Art Unit: 2882

30. Kjebon teaches a laser source with an integral dispersive element (Fig. 1). The device of Kjebon is used for the purpose of creating a signal of 30 GHz on a laser, which according to the article by Kjebon is a record high signal with increased resonance frequency and reduced damping.

31. Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to use a known laser device to create frequency modulated signals of high bandwidth for the laser of Heritage for the benefits of using a record high bandwidth signal with increased resonance frequency and reduced damping.

32. Regarding Claim 30, Kjebon teaches a single mode signal source (Pages 488-489).


Conclusion

33. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Krystyna Suchecki whose telephone number is (703) 305-5424. The examiner can normally be reached on M-F 8-6, with alternating Fridays off.

34. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert Kim can be reached on (703) 305-3492. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9318 for regular communications and (703) 872-9319 for After Final communications.

35. Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 305-4900.

ks
December 20, 2002


ROBERT H. KIM
SUPERVISOR, PATENT EXAMINER
ART UNIT 2882